May, 1956

THE CHEMIST

VOLUME XXXIII NUMBER 5

Dr. Norbert A. Lange, F.A.I.C.
Receives Ohio Award
(*See Page* 159)

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(Departments omitted in this issue for lack of space will be restored in later issues.)

TO COME IN JUNE

The proceedings of the Annual Meeting of May 9-11th, in Boston, Mass., will be featured in June. The theme, "The Chemist Looks at Communication," is developed by splendid papers from experts on various phases of the subject. So timely is the theme, that many requests for this issue are being received from non-subscribers. • The presentation of the AIC Gold Medal to Raymond Stevens, president of Arthur D. Little, Inc., will be covered. • New officers and councilors of THE AMERICAN INSTITUTE OF CHEMISTS will be announced.

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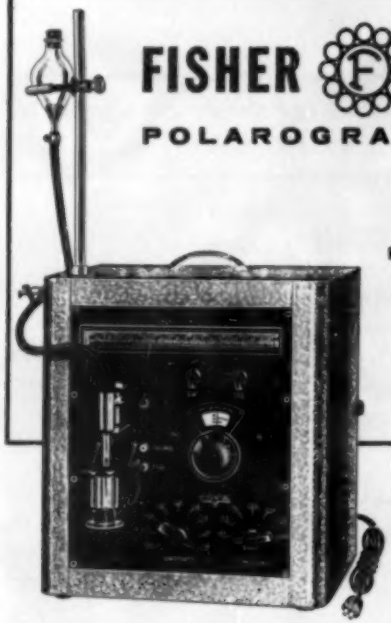

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EDITORIAL

Decertification of Unionized Professional Employees

Benjamin Sweedler, F.A.I.C.

Attorney at Law, 420 Lexington Avenue, New York 17, N. Y.
Chairman, AIC Committee on Constitution and By-Laws

THE Taft-Hartley Act provides that the National Labor Relations Board cannot include professional employees in a union with non-professionals unless the professional employees vote for such inclusion. It also authorizes decertification elections.

Recently the National Labor Relations Board held that professional employees have no right to a decertification election to withdraw from a plant-wide union which they had once voted to join, even though there had been a substantial turn-over among the professional employees during the interval of several years between the election to join and the request for a decertification election.

The facts on which this ruling was based are as follows:

Professional engineers at a Westinghouse plant in Jersey City had elected to join the AFL-CIO Electrical Workers Union in 1950. In the interval between 1950 and the petition for a decertification election, which was brought recently, there had been a large turn-over among the professional engineers employed at this plant. Apparently the present group of professional engineers desired to withdraw from the plant-wide union and go non-union.

On their petition for decertification, the National Labor Relations Board extended to professional employees the doctrine under which it denies craft and technical employees any right to withdraw from a larger unit and go non-union.

This decision of the National Labor Relations Board makes it extremely important for professional employees to consider carefully before voting for inclusion in a plant-wide union or other broad labor unit, because the decision to join is irrevocable, not only for themselves, but also for their successors.

Centennial: Of Perkin's discovery of the first synthetic dye, mauve, will be climaxed by a celebration during the week of Sept. 10, 1956, at the Waldorf-Astoria Hotel, New York, N.Y. The observance is sponsored by the American Association of Textile Chemists and Colorists, directed by the Perkin Centennial Committee.

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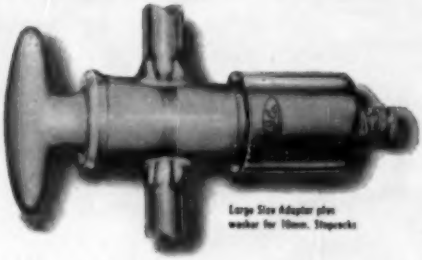

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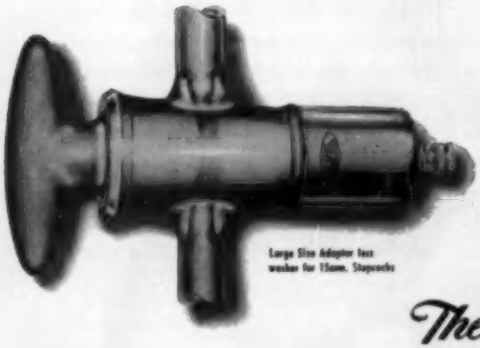

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Destiny and the Handbook

Dr. N. A. Lange

Vice President and Secretary, Handbook Publishers, Inc., P.O. Box 596, *Sandusky, Ohio*

(A condensation of a talk presented by the author when he received the Ohio Award from the Ohio AIC Chapter, April 20, 1956, at Columbus, Ohio.)

NEARLY sixty years ago, there came to the city of Columbus a man by the name of William Sydney Porter. He did not come here of his own free will. He made his home here for about three and a half years and was known as No. 30664. As a boy he had worked in his uncle's drugstore in Greensboro, N.C. As a resident of Columbus, Ohio, he worked in the pharmacy of the institution where he made his home. The peace, quiet, and freedom from the cares of the world gave him opportunity to write without distraction.

He began to have his stories accepted by magazines and he wrote under the pen name of O. Henry. To chemists it is interesting to learn how he came upon this pen name. His work in the pharmacy made him refer frequently to that handbook of the pharmacist, the *United States Dispensatory*. M. Etienne-Ossian Henry was frequently mentioned in the literature references. Throughout the book all other chemists had their names reduced to last names only, but not so with M. Etienne-Ossian Henry. Apparently the name Henry, standing alone, did not look just right to the editors and so they always inserted the initial "O" before it. William Sydney Porter must have been intrigued by O. Henry and liked to think of him as an old friend since his boyhood days in his uncle's drugstore.

One of O. Henry's short stories, "Roads of Destiny," tells of a peasant shepherd who decides to leave his flock to go into the city to make a name for himself as a poet. Walking along on the road to Paris, he comes to a fork in the road with three branches. He is undecided which road to follow. He decides to take the road to the left. He comes upon a carriage mired in the mud, helps to extricate it, meets romance, but at the end is killed in a duel by a bullet from the pistol of one of the passengers, a M. De Beaupertuys. The next chapter in O. Henry's story finds the same shepherd again on his way to Paris and coming to the same fork in the road. This time he chooses the middle path. He becomes involved in a plot to assassinate the king and, while riding in a carriage, is mistaken for the king and is killed by a bullet from the pistol of one of the plotters, M. De Beaupertuys. The third chapter again finds the shepherd on the road to Paris and at the fork in the

road. This time he takes the road to the right, meets with a literature expert who reads his poems, and advises him to give up his ambitions to become a poet. The shepherd returns home, but on the way he stops at a pawnshop and buys a pistol. Then the disappointed shepherd commits suicide by using this pistol, which, it turns out, was once owned by a M. De Beaupertuys who had been imprisoned for plotting the assassination of the king. That was O. Henry's way of describing the role of destiny in life.

However, most of us believe it is not destiny that shapes our lives so much as it is family, teachers and associates. These and a few of the many decisions we make have the most profound influence. In our handbook there is a list of the names of those who helped with its compilation and also the statement: "Grateful acknowledgement is hereby made of an indebtedness to my former teachers (who) have been of unconscious assistance in this work." Among these, certain ones stand out.

First of all is Edwin Lincoln Mosely who was my science teacher in the Sandusky High School and who later became the first professor of biology at Bowling Green State University when it was founded in 1914. He was a most unusual high school teacher; a graduate of the University of Michigan, and I presume, one who had never taken a course in pedagogy. He was interested in everything scientific, a "natural scientist." He taught biology, physics and chemistry. He was a collector of everything—animal, plant, mineral. He established a remarkable museum of natural history in the high-school. In geology, he traced out old lake beaches, underground streams, and made soundings of the rock bottom in Sandusky Bay, which were later used in locating ship channels. He experimented with animals in an attempt to find the cause of trembles in cows and the sickness among humans who drank milk from the diseased animals. He made a catalog of the plants native to Erie County. He published work in scientific journals. Several plants and animals are named for him scientifically because of his discovery of them. And he did all this while a high school teacher. In this work he had the assistance of some of his students. Were there more such teachers in our high schools today, there would be less concern about the lack of scientific interests among high school students. It was he who aroused my interest in science.

I could not go to college after graduating from high school. I had first to earn some money. I was fortunate in landing a job where a paper mill was under construction. Jobs were not too plentiful at that time. When I saw laborers getting 17½ cents an hour for a 10-hour day and bricklayers getting 80 cents

an hour for an 8-hour day, I almost decided to become a bricklayer. But after a year of this work on the construction job, Mr. Mosely's unconscious influence made me quit and enter college.

I entered the University of Michigan with the purpose of preparing to become a high school teacher of mathematics and physics. In the second semester, I took a course in qualitative analysis taught by Prof. Hobart H. Willard. It was his teaching that influenced me to become a chemist.

How my training in chemistry was directed into work on handbooks came through my association with Prof. William J. Hale, with whom I took my degree in organic chemistry. He was a son-in-law of Herbert H. Dow, founder of the Dow Chemical Co., and Herbert Dow was an alumnus of Case School of Applied Science. It was through this connection that I was offered the opportunity to teach at Case. Two other opportunities were open to me at the same time, one in a well-known institute for medical research and the other in chemical industry. I chose the one that took me to Case. I had been an instructor for several years at the University of Michigan, liked teaching and the opportunity it gave for research of one's own choice.

In 1919, several handbooks were in use. The granddaddy of them all was the *Chemiker Kalender,* issued annually, and probably named "Kalender" because the first 52-pages had a memo-calendar for each week of the year with a few lines of space for the day's notes. After each day was recorded some anniversary of interest to chemists.

Current at the same time was another handbook, Van Nostrand's *Chemical Annual,* edited by Prof. John C. Olson of Brooklyn Polytechnic Institute. This was first published in 1906, and it was planned for annual editions like the *Chemical Kalender.* However, the second edition did not make its appearance until 1909, and in its preface was the statement:

> "As a thorough revision of this kind could not be made in a year, it seemed advisable to abandon, at least temporarily, the original intention of issuing the volume annually."

In 1913, the *Handbook of Chemistry and Physics* made its appearance. It was a book of 116 pages, compiled by Prof. W. R. Veazey of the Case chemistry department, and published by the Chemical Rubber Co., a jobber of chemicals and chemical apparatus of Cleveland, Ohio. The preface of the first edition states in part,

> "In compliance with the requests of hundreds of our friends for a small but comprehensive book of reference on chemical and physical topics, we have designed and compiled this Pocket Manual of Chemistry and Physics. We shall feel amply rewarded for our effort and expense if this volume proves to be of use and convenience to the profession whose support has been a conspicuous factor in the growth of our establishment."

On the title page is printed, "Price, two Dollars." By 1920 it had reached its 8th edition, was a book of 711

pages, not counting the six pages which advertised the laboratory supplies sold by its publishers. Its price was $3.00. Prof. Charles D. Hodgman of the physics department of Case School was the editor, assisted by two teachers in the chemistry department.

It was then, in the fall of 1919, that I came to Case as a teacher. I was asked by the publishers if I would assist Prof. Hodgman by taking the place of the two assistants who had left. I agreed. Prof. Hodgman had supervision of the work and took charge of the data in physics. My association with Prof. Hodgman continued through the 16th edition (1931). This edition had 1545 pages plus 8-pages of advertising and was priced at $5.00. Because the *Chemiker Kalender* was written in German and because of less aggressive sales efforts by the publishers of Van Nostrand's *Annual*, the *Handbook of Chemistry and Physics* was beginning to take over the field.

I was also assigned the job of looking after the school's chemical library. This took much of my time, but it was well worth all the time and effort. This library work and my work on the handbook gave me a familiarity with chemical literature which I would not otherwise have had.

During these years, I formed opinions on handbooks of chemistry. Some were not always acceptable to the publishers. Consequently, in 1931, I made a decision with an important bearing on my future. I severed my connections with the publishers of the *Handbook of Chemistry and Physics*. I wanted Prof. Hodgman to do the same and join with me in getting out our own handbook, but he was unwilling. I decided to go it alone. Had I known then some of the things I learned later, I wonder if I would again be so brash!

I began the work of making a new compilation. The severe depression of the early '30's was upon us. My former student and good friend, Gordon M. Forker, like so many of his classmates, was unable to find a job. I asked him if he would be interested in helping with the compilation of my proposed new handbook. I told him there was not much immediate pay in it for him. He agreed. During the rest of that year and the school year 1932-33 we put in all of our available time on this work. I began to look for a publisher. What a surprise was in store for me!

The first publisher who was approached turned it down because of his fear of competition from a well-established book, something I later learned was justifiable. The next was enthusiastic until he learned what it would cost to produce such a book, something I, too, learned later. With these two disappointments, I was about ready to give up the idea when a friend of mine, Orwell F. Schoepfle, now president of our publishing company, suggested that I publish it.

With his help, and that of two others, one with money and the other with legal training, we decided to incorporate Handbook Publishers, Inc., and began to look for printers. We found their prices way beyond our expectations and means, although one would have gone into the venture provided he might have 51% of the stock in the company.

All the while Gordon Forker and I kept right on compiling. One day, representatives of the A. L. Garber Co. of Ashland, Ohio, called upon me. They had a large, modern printing establishment but little work. Most of their previous work had been on large runs of advertising material, but now with the business depression, no one was spending much money for advertising. Mr. W. M. Garrigus, now an officer of the Garber Company, had just come to them from the R. R. Donnelley Co. of Chicago. He believed book production might be a solution for putting their printers back to work. In short, Garber gave us attractive terms and Mr. Garrigus gave us his valuable knowledge of typography and make-up. Case granted my request for a year's leave without pay, and during 1933-34 we got out our first publication, Burington's *Handbook of Mathematical Tables and Formulas.* The manuscript of this book of 300 pages had been written by a colleague in the Department of Mathematics and was to be the mathematical section of our chemistry handbook.

I was head over heels in the work of finishing manuscript, reading proof, indexing, and taking care of the details of launching a new enterprise. So much was involved, that I resigned from the Case faculty and came to Sandusky to devote all time to the work, and which I have been doing ever since then. Prof. Veazey, the head of the chemistry department, warned me to give my resignation careful consideration, since no job might be open for me should I care to come back. My associate, Mr. Schoepfle, had his misgivings, too. Some of my friends looked at me in the most peculiar way when I told them I was giving up a job with an assured income.

Efforts to sell the handbook began in 1934. We rented space in a civil engineer's office in a building appropriately named the Beilstein Building. We had no telephone or local directory listing. Once an agent trying to locate us stopped at the local Chamber of Commerce and found we were unknown to it. He was told we were "probably some fly-by-night outfit!" The Chamber must have thought of us in the manner of one of the definitions for "handbook" given by Webster's Dictionary; namely, "a betting book of a bookmaker carried in the hand or on the person to evade the laws against bookmaking." Then there was the professor of mathematics who returned our mathemati-

cal handbook with the comment that he had no need for a book of this kind because he never worked with numbers. We were not trying to sell him the book but thought that some of his students might at some time in their lives need to have some knowledge of numbers if only to check up on the monthly bills.

There was a department of mathematics that felt the book would make the subject too easy for their students and so looked upon it as a "pony." We took advantage of this by promoting the sale there as a pony, and the point of view of the faculty helped us unwittingly in making sales. The bait of forbidden fruit!

We were generous with complimentary copies of the chemistry handbook to professors hoping that they would bring it to the attention of their students. Some of these teachers told us that because of the hard times their students did not have much extra money and that we should come back in a few years when we had an old edition for sale at a cut price! One professor would not even accept the book as a gift because he said they had no use for a book of this kind at his school. There was a book review written by one who considered himself a scientific literature expert and who made his living by making literature searches for clients. He said he saw no need for another book of this kind when there was already on the market that excellent handbook on oil, gas, and tar published by the Kansas City Testing Laboratory. To this day, I cannot understand why he should have made a comparison with that book unless he was fearful of losing a little income by charging a client for some bit of data which the client might have found in one of the handbooks.

Having heard the story of the man who made a better mouse trap and how customers wore a path to his door, I thought all I had to do was to make a better handbook. Now I appreciated why one publisher hesitated to accept our manuscript because another handbook was firmly established. To this day, after twenty-five years, there is still confusion in the minds of some as to who are the publishers and editors of competing handbooks. We get orders for their books and they for ours.

There are few original data in our handbook. Nearly all can be found in good chemical libraries. But some chemists do not have chemical library facilities. For them a handbook is a godsend. The disadvantage of a handbook is that it cannot contain in one volume all the information contained in hundreds of volumes in a good chemical library. Moreover, often it gives only one datum for some physical property, as a melting point or a boiling point, when several are reported in the literature. Solving these shortcomings is the biggest problem confronting the compiler—what to include and what to omit; and which of several numer-

ical values to select for a given property.

A criticism often directed at handbooks is the lack of literature references. Some feel that the data are not reliable because of this lack. John Perry, editor of *Chemical Engineers' Handbook*, once said to me, "If you tell a person, he may have some faith in your statement; if you write it, he is inclined to put more faith in it; if it appears in print he considers it to be authentic, but if it is printed along with a literature reference, he will swear to its reliability."

Librarians in public libraries usually keep the handbooks at their desks because of their ready reference value and especially to prevent theft from the shelves. That handbooks are likely to disappear from the library shows that they are useful.

In addition to its ready-reference value, another advantage of the handbook is its tabular arrangement. If one has the problem of making a selection of compounds with a certain property in mind, it is much easier to run down a column of numbers than to search to find the compounds falling within the classification. A friend at a university with one of the best chemical libraries told me he used our handbook to select nitrous oxide as the propellant gas in his invention of the gadget used at soda fountains for squirting whipped cream on sodas and sundaes.

Mechanically, the book is set in monotoype, in which each letter is cast individually, as distinguished from linotype which casts one whole line of type. Monotype is used because of the many special characters required, the ease with which monotype can be put in tabular form, and the ease with which typographical corrections can be made. It is not necessary to reset an entire line of type if just one letter turns out wrong. Electrotype plates are made from this type and the book is printed from these plates. Changes are made on the plates by patching expertly. In each edition, we have hundreds of changes made to standing plates, and a casual comparison of the same table in different editions will not show them. The book is printed 32-pages at a time, a signature. These signatures are collected and bound. The book already carries notice of copyright printed on the reverse side of the title page. When the book makes its first appearance it is offered for sale to the first person who happens along, whether or not he buys it. The fact that the book has been offered for sale establishes, according to copyright law, the date of publication. Two copies are then sent to the copyright office along with the application for copyright and the required fee. This accomplishes a copyright for twenty-eight years with the privilege of one renewal for the same length of time.

Most of the tables in our handbook do not carry credit lines as to authorship yet some are the work of

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others. The reason for this anonymity is that I wish to retain the right of making changes as may be necessary without the delay or perhaps inability of getting another's approval. To make changes without approval does not seem fair to the original compiler of a table if his name appears with it. Not to make changes would not be fair to the publishers or to me. I have never paid a contributor for his work. To give a fair payment would many times be prohibitive, to give less might be insulting to his standing in the profession.

Price-wise, are handbooks bargains? Not counting the cost of compiling, editing and proof-reading, I would say that $30.00 is a fair estimate of the cost of each printing plate. With a book of 2000 pages, each page requiring one plate, this represents an investment of $60,000. To this must be added the cost of paper, printing, binding, general sales, and office overhead. In a recent issue of the *Journal of Chemical Education,* eleven books were reviewed. They averaged 424 pages per book at an average selling price of $6.79 per book, or an average cost of 1.6 cents per page. The latest edition of our handbook, nearly 2000 pages, sold for, not 1.6 cents per page or $32, but for $7.00 to the trade and $5.00 to students. How is this possible? Maybe it is like the clothing merchant who said he sold all of his suits below cost and could do this only because he sold so many of them!

In an editorial, entitled "A Tower of Babel in Science," which appeared in a 1953 issue of *Chemical & Engineering News,* Walter J. Murphy quotes Vannevar Bush as follows:

> Only too often, the work of a man or woman who is helping to disseminate scientific and technical knowledge intelligibly does not receive the recognition such service deserves, and their labors are performed at the sacrifice not only of their own careers in strictly novel research, but also of their scale of living, for the direct rewards of this sort of publication are not large. I wish there were more generous support for labor of this sort and more recognition for this type of attainment.

Coming back for a moment to O. Henry's story, I sometimes wonder what would have been in store for me if I had chosen to take either one of the other roads before me. Would the one to the institute for medical research have been more rewarding with its opportunities to do research? Would the one into chemical industry with its opportunities for greater financial return have been preferable? I doubt if either would have brought me into work on handbooks.

I feel sure neither would have given me greater happiness or contentment.

In closing, I quote B. C. Forbes, publisher of *Forbes Magazine*:

> The deep down desire to stand well with our fellows, this laudable hunger to win the public's "well done, good and faithful servant," is inherent in every normal soul. We may flout it when we are young or even in our prime, but when we begin to cast up our life's reckoning we cannot ignore it. We realize that this is one of the things that counts, one of the things really worthwhile, this esteem and goodwill of our brother mortals, and the knowledge that we have sincerely tried to earn it.

Presentation of the Ohio Award

THE Ohio Chapter of THE AMERICAN INSTITUTE OF CHEMISTS presented its Ohio Award to Dr. Norbert A. Lange, vice president, Handbook Publishers, Inc., Sandusky, Ohio, at a dinner held at the Fort Hayes Hotel, Columbus, Ohio, April 20, 1956.

The dinner concluded the all-day Annual Meeting of the Chapter, during which visits were made to the Battelle Memorial Institute and Ohio State University. Dr. J. H. Koffolt, chairman of the Chemical Engineering Department of Ohio State University, was chairman of the program committee. The theme of the meeting was "The University Today." Dr. Ray P. Dinsmore, AIC president, spoke at the afternoon session on "Professional Recognition."

Dr. Lange was introduced by Gordon M. Forker, his associate on the *Handbook* and a former student, who spoke extemporaneously on Dr. Lange's career.

Dr. Lange was born in Sandusky, Ohio, August 4, 1892. He received the A.B., M.S., and Ph.D. degrees from the University of Michigan, where he was instructor in organic chemistry until 1919. He was assistant professor at Case Institute of Technology from 1919 to 1934, and associate professor until 1935. He lectured in chemistry at Western Reserve University from 1925 to 1952. Since 1935, he has been vice president and secretary of Handbook Publishers, Inc.

In 1946, Dr. Lange married Dr. Marion Cleaveland, then assistant professor and assistant dean in Flora Stone Mather College of Western Reserve University. Both are musically talented. As a student Dr. Lange earned part of his expense by playing in restaurant and dance orchestras. He played French horn in the Michigan band. He plays violin weekly with a local string quartet. Often he and Mrs. Lange play violin and piano sonatas in the evenings for their own amusement. They live on Cedar Point peninsula where Lake Erie is their front yard and Sandusky Bay their back yard, and so, as Dr. Lange says, "my loafing is usually done around, on, or in the water."

Dr. Lange Accepts Ohio Award from Mr. Olson

The citation on the Ohio Award, presented by Harold M. Olson, chairman of the chapter, reads:

To Dr. Norbert A. Lange, F.A.I.C.

For achievement in chemistry which has brought distinction to the chemical profession and the Ohio Chapter.

Plastics Exposition: The Society of the Plastics Industry, Inc., will hold its seventh National Plastics Exposition on June 11-15, 1956, at the new Coliseum in New York, N. Y.

Moved: The Scientific Manpower Commission from the Carnegie Institution of Washington to 1507 M St., N.W., Washington 5, D.C.

Honored: E. W. Fasig, F.A.I.C., general superintendent of The Lowe Brothers Co., Dayton 2, Ohio, who received the George B. Heckel Award of the Federation of Paint and Varnish Production Clubs, in New York, N.Y., Oct. 4th, "in recognition of his contribution in technology and production for the paint industry."

The Teacher*

. . . busy as a bee

. . . poor as a churchmouse

. . . happy as a lark

PART II

WHERE TO GET AHEAD: IN TEACHING OR IN INDUSTRY?

Now that we have equipped our covered waggons and set out across the Great Plains, we come at last to the point of decision: Whither? To Oregon or California, to apples or gold, to teaching or industry?

How long should we study? One is not properly prepared for a research career, either in teaching or industry, until after many years of study: four years in high school, four in college, and three or four in graduate school. To young people this is a frightening thought: We shall be old (sic) before we start out in life. Is the Ph.D. worth the trouble? The answer is: There is no alternative, and it most certainly is worth the trouble. You must have this training, and the sooner you finish it, the more interesting life will be. Be comforted by two thoughts: First, that the few extra years of graduate training will seem very short indeed twenty years hence; and secondly, that your graduate years are spent in actual research, that your thesis work does not differ in research character from your out-in-the-world research. And the real answer to "how long shall we study" is: All your life.

Teaching versus research. In the teaching profession there are four types you may choose from:

	Training/Research	*Salary*
High School	T	¢
College	TR	¢
University	TR	¢
Research Laboratories	R	
Governmental (Oak Ridge, Brookhaven)		$
Private (Mellon Institute, Battelle)		

Your job in High School would be almost entirely teaching; in the College it will be a great deal of teaching and a certain amount of research; in the

*Presented by Dr. Hubert N. Alyea, Frick Chemical Laboratory, Princeton, N.J. at a joint meeting of the American Chemical Society, North Jersey Section, and The American Institute of Chemists, held in New Brunswick, N.J., on December 1, 1955, on the topic: *The Facts of Life for Chemists.*

University it will be less teaching and much more research; and, finally, in the Research Laboratories, which often do not differ greatly from research in Industry, it will be almost entirely research. Now fortunately all of these professions require essentially the same training, so that your decision as to which one you will go into does not have to come early in your training. Of course, if you are sure you will go into high school teaching, your schedule must include courses in education, many of them, as well. But you can make your decision as you go along in your studies.

Let us say something about each of these levels of teaching, to help you crystallize ideas as to your own future.

High School Teaching

You go into high school teaching if above all else you like to be with young people, if you like Scout work. This is a noble profession, a patriotic profession, a highly rewarding profession in the satisfaction which comes from influencing the lives of others; for future scientists are recruited by inspiring high school teachers.

Pros: You will not necessarily worry over your work, as an administrator or a research man does. You can, I know many who do, drop your work in the classroom and go home to a number of carefree hours of happy social life each day.

Cons: You must be a good disciplinarian; not stern, but able to handle young people easily. You will be over-worked, and find yourself physically exhausted by five o'clock each day, for you will be called upon for many extra-curricular activities outside of science in your school work.

Salary: The salary scale for high school teachers is improving, and in a few years may be satisfactory. At that you will be better paid than your colleagues in the small colleges. Besides you will have increasing opportunities for summer employment in industry. Your salary will be based on years of service and not on merit. It is unfortunate that the high school teacher comes to realize that ten years from now his salary will be just so much regardless of how good or bad his teaching in the interim may be; on the other hand it is difficult to see how a merit system could be successfully applied, free of political motivation, in our public school system. Probably your hardest financial problem will be to resist the inducement of transferring to administrative work in your school: Three to ten-thousand dollars a year more (as a reward?) for giving up the science and teaching for which you trained yourself, and to which you intended to devote your life. This is the way our Boards of Education reward (?) teachers who become school principals. You will

be committed to living simply in company with other low-paid teachers; but then misery loves company. You will not be able to provide your family with security against sickness, this hurts; and you will not be able to afford luxuries, this is fortunate.

College Teaching and Research

Pros: Here you will have some time for research, and eager science students to help you carry on that research. You will not work so hard at your research as you do in a university: Also I believe that there is more social life in the small college town than in that of a large university where everybody is just too busy for any other interests. And you will be your own boss, an advantage which is discussed later in some detail.

Cons: You will spend a good deal of your time baby-sitting, especially in the smaller colleges. You coach football, you run the camera club, you conduct the orchestra, you direct dramatics, you do many petty jobs which rob you of research time.

Salaries: In most small colleges, salaries are rock-bottom, although in some top-notch colleges, such as Amherst and Williams, salaries compare favorably with, or are better than, those in the universities. On the other hand, life in a small college town is universally simple, so a large salary is unnecessary. There is no keeping-up-with-the-Joneses. You don't have to convince everybody but the tax collector that your husband makes a lot of money. If you appear wearing a mink coat the rest of the faculty will know that you have been living on beans all year. But you have little security against family sicknesses or money for educating your children. However, many colleges give free tuition to the children of their faculty, and recently a reciprocity in this custom has been set up, so that, for example, Princeton professors who have only girl-babies are not discriminated against!

University Research and Teaching

Pros: You will be your own boss. Completely. If tomorrow I want to go into my laboratory and, for the next ten years, study the effect of beryllium on rabbits' ears, I can do it. Nobody will say I am crazy and interfere with my work, or accuse me of wasting university funds. I can go ahead and play, intellectually speaking, to my heart's content. This is something all of the money in the world can not buy. And that is, perhaps, why it is so thrilling to be in the teaching profession in a university where you can conduct unfettered research. Some industrialists have said to me: "You are lucky. You can keep on working at any problem that arouses your curiosity. With us, when we get to the point where our research problem is just becoming inter-

esting, it begins to pay off, and we have to shift to something else." It is this unfettered research, and teaching, that makes those in the teaching profession

. . . as busy as a bee
. . . as poor as a churchmouse
. . . as happy as a lark.

Cons: Promotion and security furnish the major problems in the university. Industry can reward meritorious performance with increases in salary. The university often cannot, for it operates on a fixed budget. Discover something revolutionary in your company and their profits skyrocket, and your salary with it, for the industry's budget is elastic. Teach better in a university and the endowment fund may go up—after you and your benefactor student have died.

Take the example of an excellent teacher, who is also a top-notch research man. Good research is a *must* for any University teacher, for if he is not also contributing to the advancing frontier of knowledge he will make a very dull teacher indeed after a decade or so. So this teacher has been at work for ten years or more, first as an instructor, then as an assistant professor. He still doesn't know whether the university will keep him. He and his wife still, each Spring, anxiously await the mailman who will bring him news that he has been reappointed for another year, and can continue his planned research instead of going elsewhere. He still, at age thirty-six, has an uncertain future. And then at last, after a decade or so, the university says to him: "Well, you have at last proved yourself. I guess we will make you an associate professor." How different it is in industry! The day he enters the chemical plant he is reasonably certain that if he delivers the goods respectably, he has company tenure. In fact this is one of the dangers of settling into an industry: You may get into a rut and stay there when you really should be moving on.

The matter of promotions in the university is equally disturbing, though I can offer no better solution other than what is now being done; and I feel that the present administrators are doing their human best, considering that they are operating on a fixed (or shrinking) budget. Dr. A is up for promotion, not having been promoted for six years. Dr. B, who does much less teaching and a great deal more research, and is therefore better known to the outside world, gets a bid from another university, or from industry. He comes in to the chairman of the department with a demand bid, an appropriate term to use in this instance, "I know Dr. A has been here for four years more than I, but Company XYZ will pay me twice as much as you do; so either promote me or I leave." What does the chairman do? What can he do? He sees the president; then he returns to Dr. B with the word: "OK, you will be promoted." Then he goes back to Dr. A to console him as best he

might; promises favorable action the year after next, by which time the president and the chairman will have both died.

If you don't like hard work, this next item is a *con*: You will work hard in a university. For example, I arose this morning at 7 a.m.; I was in the laboratory at 7:30 a.m.; I gave two lectures and conducted two classes this morning; I had a three-hour laboratory and a class this afternoon, and finished my last class at 5:30; and here I am. Now this isn't a typical day in the life of a Princeton professor; but it shows that you can keep busy. I like to work hard, and this is a *pro* not a *con* for me. Hard work at what you really like to do is the greatest fun in the world. This reminds me of the young lady who was being examined by a psychiatrist. Said he, "Young lady, are you bothered by any immoral thoughts?" "Why no, doctor," she replied, "in fact I rather enjoy them." And so I can say that hard work, perhaps eighty hours a week, is so much fun when you are a chemist, that you rather enjoy it. You certainly don't watch the clock.

Salaries: These are definitely better in the university. Also the chemist can supplement his university salary by writing texts (particularly if you teach a freshman class of 3000!), and in doing consultant research. I don't really believe that a man in a large university makes a great deal less than his colleague in industry, considering the simple level of living to which he accustoms himself in a university town.

Research Laboratories

There are increasing opportunities for chemists who prefer a life of pure research: The Bureau of Standards in Washington, the Atomic Energy Commission laboratories as at Brookhaven or Oak Ridge, the Regional government laboratories at Birmingham, Alabama, or Peoria, Illinois, or Kansas City; and private research laboratories such as the Mellon Institute in Pittsburgh or the Battelle Institute in Columbus, Ohio. There are frequent seminars and the presentation of ideas and research accomplishments to their clients, so that there is a certain amount of teaching. Also it is basic research of a high order: In fact often better research facilities than the university can afford. When I was a graduate student, the universities alone provided opportunities for basic research; today governmental, private, and company laboratories vie with one another in the elaborateness of their research equipment.

YOUR WIFE

I have saved the best till last. Your decision, teaching or industry, depends not only on your own nature, but on that of your wife as well. You will be concerned that the teaching profession cannot guarantee sufficient security,

not for yourself but for your wife and future family. But their sacrifices will not be so great as you may imagine. True they will lack monetary security. But they will, on the other hand, benefit from several compensations. When summer comes, your plans for work and play can be worked out freely, with mutual interests in mind. (No, you do not have three months' vacation, as the industrialist may imagine the teacher has.) In fact there is a freer program for the family throughout the entire year. A freedom to work when and where you wish, and of being your boss at all times. A simpler life, it is true, but one that is similarly shared by your neighbors in the college community. A freedom for unfettered research.

Think of it! They *pay* you for having fun, intellectual fun, that is. The fun of adding a cubit to the mound of human knowledge in this world; the fun of inspiring others to intellectual curiosity about the workings of Mother Nature; fun amongst the smokes and fumes, soots and vapors, fires and odors:

> . . . "yet amongst all these Evils I seem to live so sweetly that may I die if I would change places with a Persian King."

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Communications

Patents

To the Editor:

The editorial on anti-trust lawsuits involving patents, in the March issue of THE CHEMIST, is misleading. It tells only half of the story of anti-trust litigation inaugurated by the government against large corporations.

The American economy is a competitive economy. This is our basic way of life in contrast to a planned or socialistic society. If corporations plan among themselves to eliminate competition, the harm to the public is just as damaging as if the government prevented competition as in Russia.

It is competition that makes for better quality of merchandise at lower cost. This is why the Russian products are of poorer quality. As between the necessity of retaining competition or the patent system, the need to retain competition is the greater.

Hence, where patents are used in conspiracy between corporations to corner or control the market and thus eliminate competition, the courts in anti-trust actions hold the patents to be misused and compel the corporations to cleanse themselves of the misuse before the patents become enforceable. Thus it is the misuse or abuse of patents by corporations that render them unenforceable. No corporation not misusing its patents need fear loss of patent rights.

The right to a patent is not a constitutional right. It is a mere legislative enactment which can be terminated by another legislative enactment. But competition is the very back-bone of the American way of life. If competition can not be terminated by legislative enactment, as this would mean socialism, it surely should not be terminated by use of conspirational agreements based on patents used by large corporations.

The anti-trust actions brought by the government against large corporations who conspire to eliminate competition are generally settled by consent decrees wherein the corporations consent to being punished rather than face trial. Generally speaking, only guilty parties agree to be punished, and corporations entering into a consent decree are or believe court produced evidence will show them to be guilty.

The courts in anti-trust cases based on patents often require the patents to be licensed to all comers on fair royalty (i.e. monetary) terms in order to avoid the taint of misuse.

Patents are indeed granted to promote progress. However, the use of patents themselves as a weapon to eliminate progress by eliminating competition is not tolerated under our form of government. The threat of reverting to secrecy in lieu of patents is impractical. No corporation can retain a secret very long and many inventions, such as merchandise, by their very nature teach their patentable features by mere inspection.

No person or corporation need fear legal use of a patent. But where a person or corporation uses a patent as a club to force the licensee to purchase unpatentable refilling material, such as salt tablets in one case, there is a misuse of the patent, and the patentee comes to court with unclean hands. Hence, the patentee is not in a position to ask the court's aid. In other words, the patent is unenforceable since the court will have nothing to do with it so long as the patentee's hands are unclean.

It is in the interest of salvaging an unenforceable patent, that the corporations enter into a consent decree, since an unenforceable patent is about as valuable as an expired patent.

—Dr. Frank Makara, F.A.I.C.
New York, N. Y.

For Future Explosives Chemists

To the AIC:

I am twelve years old and am interested in chemical action in warfare. I would like some advice and a list of equipment I should have.

—John Lillywhite, Jr.

To the Editor:

Thank you for your letter concerning the inquiry of young John Lillywhite, Jr., for information on the use of chemistry in warfare. I am sure the AIC would like to continue the interest of all young people who may advance the profession and the science in later years.

I enclose a selected bibliography which

should be of interest to any serious student of armament or of chemistry in warfare. Unfortunately there are few, if any, booklets which are prepared expressly for use by a student of high school level. Very few students after college or graduate training in chemistry have specialized or have been prepared for work in explosives. *To survive in the field of military explosives* or in the explosives industry in general, a closely supervised and carefully planned program of "on the job training" is necessary for everyone.

After 15 years of continuous work in the field of research and development of military explosives, my advice to this young man is this:

"Obtain the standard chemistry kit through your local high school chemistry teacher and perform such experiments as he may suggest. *Don't try to make explosives or poisonous gases. The first mistake can cost you your life.*"

I hope these comments will help you reply to him with the suggestion that at some later date we shall welcome John to join the thousands of chemists and scientists engaged in ordnance work.

Bibliography of Ordnance Literature

Ammunition

Ammunition: Its History, Development, and Use. By Melvin M. Johnson, Jr., and Charles T. Haven. William Morrow & Co., N.Y. (1943, 374 pp.) A complete story of ammunition, up to the 20mm shell, with charts, tables and illustrations by two well-known authorities.

Chemistry of Powder and Explosives. By Tenney L. Davis. John Wiley & Sons, N.Y. (1943, 489 pp.) A standard textbook with a technical presentation of the chemical and physical phenomena of explosive substances up to date of publication.

Elements of Ammunition. By Theodore C. O'Hart. John Wiley & Sons, N.Y. (1946, 412 pp.) The basic text covering design of military explosives, primers, detonators, tracers, small arms, artillery, aircraft weapons, pyrotechnics, rockets, mines, and grenades.

Atomic Weapons

The Effects of Atomic Weapons, Los Alamos Scientific Laboratory, U.S. Government Printing Office, Washington, D.C. (1950, 456 pp.) Compiles the effects of these weapons on personnel and materiel. Discusses protective measures and materials.

The Hydrogen Bomb, by James R. Shepley and Clay Blair, Jr. David McKay Co., New York. (1954, 244 pp.) The story of America's struggle to produce the H-bomb.

Report on the Atom, by Gordon Dean. Alfred A. Knopf, Inc., New York. (1953, 321 pp.) A non-technical history of atomic-energy development.

Ordnance

Armament and History, 2nd edition by Maj. Gen. J. F. C. Fuller, Chas. Scribner's Sons, New York. (1945, 207 pp.) Foremost discussion of the major weapons of history, their use, and their effects on warfare and policies.

Weapons: A Pictorial History, by Edwin Tunis, World Publishing Co., Cleveland. (1954, 152 pp.) A graphic exposition of weapons from the stone axe to the atomic cannon. Excellent for the beginner and for the general student of ordnance.

Naval Weapons and Their Uses. U. S. Naval Institute, Annapolis. (1943, 72 pp.) Covers naval ordnance materiel and used by fourth classmen at the Naval Academy.

Rockets and Guided Missiles

Guided Missiles, Rockets and Torpedoes, by Frank Ross, Jr., Lothrop, Lee and Shepard, Inc., New York. (1951, 186 pp.)) a comprehensive treatment written in non-technical language. Covers World War II projects and past war developments in America.

Rockets, Missiles, and Space Travel, by Willy Lev, The Viking Press, New York. (1951, 436 pp.) The evolution, progress and future of rockets, guided missiles, space stations and space ships.

Space Travel, by Kenneth W. Gatland and Anthony W. Kuesch. Philosophical Library, New York. (1954, 205 pp.) The complete story containing details of German rocket work and American contributions. Written by two British experts.

—Oliver E. Sheffield, M.A.I.C.
Explosives Research Chemist

Please Note

To the Editor:

The mention of John Wiley & Sons, Inc., as the publisher is missing in the review of Barlow: "Introduction to Chemical Pharmacology" (March CHEMIST, page 108). We import this book from Methuen, but it is available through us and distributed from our offices . . . The price of $6.25 is the American price.

I am afraid that anyone interested in the book may be writing directly to Methuen and that complications as to price and shipment may arise. If it is at all possible to do so, could you run a brief notice stating that the book is available through Wiley?

—Rose Orente
New York, N.Y.

International Congress: On Catalysis will be held at the Bellevue-Stratford Hotel, Philadelphia, Pa., September 10-14, 1956. Funds are available to support the attendance of scientists from academic and nonprofit institutions. Speakers include Eugene J. Houdry, Sir Eric Rideal and Sir Hugh Taylor. Registration ($10.00) by mail includes a set of preprints. Inquiries concerning registration, financial support and organization of the Congress should be sent to Dr. H. Heinemann, Executive Secretary, International Congress on Catalysis, P. O. Box 7686, Philadelphia 1, Pa.

Announced: By Dr. Eric J. Hewitt, vice president, Evans Research & Development Corp., New York 17, N.Y., the appointment of a full-time library staff of two: Mrs. Rosalie Morris, librarian, and Miss Ellen Fisher.

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New Position: For Dr. Leonard Smidth, F.A.I.C., who is now with the Research and Development Division of American Viscose Corp., Marcus Hook, Pa. He was formerly technical director of Sylvan Plastics, Inc., New York, N. Y.

Promoted: Harold J. Rafson, M.A.I.C., to the position of assistant director of technical services for the International Operations of General Foods Corp., Hoboken, N.J.

New Position: For Dr. Joseph Matt, F.A.I.C., who is now with the Alkydol Laboratories, 3242 South 50th Ave., Cicero 50, Ill. He was formerly with Virginia-Carolina Chemical Corp., Richmond, Va.

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Paul E. Reichardt, *Washington Chapter*
George L. Royer, *At-Large*
M. Sittenfield, *Pennsylvania Chapter*
W. J. Sparks, *At-Large*
Charles L. Thomas, *At-Large*
Albin H. Warth, *Baltimore Chapter*
L. T. Work, *Past President*

Report of the Secretary

1955-1956

The National Council held five meetings during the year with an average attendance of thirteen officers and councilors.

The following actions upon membership were taken:

Elections		
Honorary	1	
Fellows	57	
Members	18	
Associates	131	
Total		207

Reinstatements		
Fellows	4	
Total		4

Loss of Membership		
Resignations		
Fellows	45	
Members	5	
Associates	21	
Total		71
Dropped		
Fellows	2	
Members	1	
Associates	19	
Total		22
Deceased		
Honorary Members	2	
Life	1	
Fellows	14	
Members	4	
Associates	1	
Total		22

SECRETARY'S REPORT

Total Gain in Membership	211
Total Loss of Membership	115
Net Gain in Membership	96

Transfers

Fellows to Honorary	2
Members to Fellows	4
Fellow to Associate	1

TOTAL MEMBERS:

	May 1, 1955	May 1, 1956
Fellows	1920	1921
Members	292	296
Associates	427	518
Life	40	39
Honorary	36	37
	2715	2811

We have welcomed 211 new members into the AIC between May, 1955, and Feb., 1956. Those qualified persons who have applied for membership since February, when the last Council meeting of the 1955-56 fiscal year was held, will be elected at the May 9th meeting of the Council, and are, therefore, not included in this Annual Meeting report, but will be in the report for the next fiscal year.

Honorary AIC Membership was conferred on the following Fellows this year: Dr. Harry B. McClure and Dr. Roy C. Newton. Honorary Membership, according to custom, was given to the AIC Gold Medalist, Dr. Carl S. Marvel, who was honored at our 1955 Annual Meeting.

In accordance with ARTICLE VI, Section 6 of the By-Laws, the following Fellows of the Institute were given Emeritus status:

Benjamin A. Anderton
Dr. Morris J. Blish
Dr. Perry A. Bond
Dr. William D. Bost
Dr. Dorah L. Burnell
Harry W. Charlton
Dr. John C. Cothran
Pierre Drewsen
Dr. Siegfried Florsheim
Dr. Frederic S. Granger
Dr. Ivor Griffith
Irving Hochstadter
Dr. Winfield S. Hubbard
Daniel P. Knowland
Dr. Erwin Kuh
Dr. Eric C. Kunz
Luther M. Lauer
Robert F. McCrackan
Dr. Albert R. Merz
Burton L. Pfeiffer
Wilmer C. Powick
Dr. William L. Prager
R. F. Revson
Paul Cobb Rich
Dr. Albert Salathe
Max Y. Seaton
G. P. Shingler
Ralph C. Shuey
Dr. Alvin Strickler
Christian Weaver
Dr. Willis K. Weaver
Dr. Colin W. Whittaker
Dr. William F. Zimmerli

It is with deep regret that we record the following deaths:

Mary L. Alexander, F.A.I.C.
Dr. Dorah L. Burnell, Emeritus Fellow
Leo M. Christensen, F.A.I.C.
Dr. Albert E. Edel, Charter Member
Dr. Gustav Egloff, Hon. AIC (Gold Medalist)
Dr. Egbert B. Freyer, F.A.I.C.
Dr. Albert F. Guiteras, F.A.I.C.
Dr. Hilton Ira Jones, F.A.I.C.
Ivar H. Kinneberg, M.A.I.C.
Edward T. Ladd, Charter Member
Dr. John P. Marble, F.A.I.C.
G. W. MacPherson Phillips, F.A.I.C.
Earl B. Putt, F.A.I.C.
Lester Quint, A.A.I.C.
Edward J. Reardon, M.A.I.C.
Sidney H. Roberts, F.A.I.C.
Dr. Henry C. Sherman, Hon. AIC (Gold Medalist)
Edward F. Snyder, F.A.I.C.
Dr. Enoch F. Story, Jr., F.A.I.C.
Willard I. Upson, M.A.I.C.
Donald J. Walls, M.A.I.C.
Dean Williams, Life Member

Dr. Dinsmore, AIC president for this year, has done much to emphasize the attainment of professional consciousness and attitude as essential to the chemist and chemical engineer who wishes to advance his profession. He has commented that only a small proportion of chemists and chemical engineers, at present, show interest in professional matters. It is these who are especially invited to join with the AIC, whose whole work is to ad-

vance professional status. This year a special committee was created, headed by Dr. George L. Royer, to determine ways and means of accelerating professional objectives.

At the beginning of this 1955-56 fiscal year, it was found necessary to increase the dues of Members and Fellows by a small amount to cover increased operating expenses. For example, the rental for the headquarters office was increased materially this year. Dues for Fellows of the AIC were originally set at $10.00 when the AIC was founded in 1923. They were never increased until 1955, when they became $12.50. Our members, generally, with few exceptions, realize that dues have thus been kept at an absolute minimum throughout the years. This was made possible by the many special services and other aid supplied by officers, councilors, or members from time to time.

Members can assist us in keeping expenses down in ways which will be of no cost to them. Thus, if they will send changes of address or business positions to the AIC promptly, it will keep our records up to date, and will eliminate the expense of returned and remailed, second class mail, and the time and expense necessary to write to references or colleges to locate present addresses. The prompt payment of dues will save us the expense of follow-up notices and letters. These are small items, but collectively, they can amount to a worthwhile sum.

The Institute and its Committees are always happy to assist individual members with their professional problems, whenever these are brought to their attention. During the year, we have answered many letters and inquiries. We have also received many inquiries from students interested in science.

The AIC obtained affiliate status with The American Association for the Advancement of Science, (Section C,) entitling it to appoint two representatives to the Council of the AAAS. Fellows of the Institute are now automatically eligible for Fellow membership in the AAAS, if they desire it.

Our Committees and Chapters have been active, as will be shown by the other reports presented at this Annual Meeting. The Chicago Chapter was host to the memorable Annual Meeting held in Chicago in May, 1955. Arrangements were excellent and the Committee is to be congratulated for an excellently-run and pleasurable meeting.

We are grateful to the members of the Institute who have given generously of their personal time and effort, through Committees, Chapters, and in other service, to advance the professional status of chemists and chemical engineers. To our president, Dr. Dinsmore, we extend the warm thanks of the Institute for the impetus he has given to its professional program, and for the privilege of having his whole-hearted leadership.

Lloyd Van Doren
Secretary

March 1956

Will You Come

May, 1956. (date to be announced). Washington Chapter. Annual Meeting and election of officers. For information: T. Allan Davis, 1016 Urell Place, N.E., Washington 17, D.C.

May 1, 1956. Louisiana Chapter. Honor Scroll presentation to Harold A. Levey, president, American Product Mfg. Co., New Orleans, La. Awards to outstanding students in area colleges and universities.

May 3, 1956. New Jersey Chapter. Military Park Hotel, Newark, N.J. Cocktails, 6 p.m., Dinner 7 p.m. Presentation of Honor Scroll to H. F. Wakefield, F.A.I.C., Bakelite Company, division of Union Carbide & Carbon Corp. Speaker for recipient, Dr. Foster D. Snell, F.A.I.C. of Foster D. Snell, Inc. Student Medal Awards. Speaker: Dr. Mason W. Gross, provost, Rutgers University, "Higher Education in New Jersey."

May 3, 1956. Pennsylvania Chapter. Student Medal Awards. Speaker, Dr. Sidney Cantor, "Creativity in Arts and Sciences."

May 9, 1956. The AIC President's Reception to the Officers, National Councilors, Members of the Annual Meeting Committee, and their wives. Hotel Statler, Boston, Mass.

May 9, 1956. National AIC Council and Board of Directors. Dinner Meeting. Statler Hotel, Boston, Mass.

May 10-11, 1956. Annual Meeting. The American Institute of Chemists, Inc. Hotel Statler, Boston, Mass. Theme: "The Chemist Looks at Communication." See ANNUAL MEETING Program, April CHEMIST.

May 25, 1956. Chicago Chapter. Dinner, Engineers Club, Chicago, Ill. Panel discussion, "Chemistry, Men and Money." Moderator: Dr. Archie B. Cramer, F & F Laboratories. Panel members, Albert S. Henick, Quartermaster Food & Container Institute, and Dr. Donald J. O'Connor, Standard Oil Company (Indiana).

May 29, 1956. Western Chapter. Dinner, University Club, Los Angeles, Calif. Honor Scroll award to George Parkhurst, senior executive, Standard Oil Co. of California. Presentation of student medals to outstanding group of senior students. For information: T. F. Bewley, Braun Corp., Los Angeles 54, Calif.

June 7, 1956. New York Chapter. Annual Dinner Meeting. Hotel Commodore, New York, N.Y. Presentation of Honor Scroll to Dr. Charles N. Frey, consultant and lecturer, Massachusetts Institute of Technology, Cambridge, Mass. Speaker for the honor recipient: Dr. R. R. Williams, Research Corporation. Toastmaster, Richard L. Moore. Presentation of Scroll, Dr. Wayne E. Kuhn, The Texas Co. Acceptance Address, "Coordinating Fundamental and Industrial Research," Dr. Frey. Reception sponsored by Standard Brands, 6 p.m. Dinner, 7 p.m. Reservations ($8.00) Shepherd Stigman, G. M. Basford Co., 60 E. 42nd St., New York 17, N. Y. (MU 2-2838).

June 15, 1956. Chicago Chapter. Annual Meeting. Election of officers. For information: H. F. Schwarz, COmmodore 4-8800, Ext. 475.

May 22-24, 1957. Thirty-fourth Annual Meeting. The American Institute of Chemists. Sheraton-Mayflower Hotel, Akron, Ohio.

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Glass Reinforced Plastics

Edited by Phillip Morgan. Philosophical Library. 1955. 248 *pp.* 6" x 9". $10.00.

A good deal of literature exists on each one of the phases of this many-sided subject, but here is the first attempt to bring together the essentials of organic chemistry, design production, and molding necessary for an understanding of the nature and functions of these plastics.

The authors are all specialists in their respective fields and each subject is discussed in enough detail to be of interest to specialists in the field. The chief resins used for bonding glass are all briefly described, but polyesters, as the most widely employed, are given more detailed treatment. One chapter deals with ancillary materials and the various forms of glass reinforced are described as well as the properties of the laminates. Methods of commercial welding and mass-production are outlined and one chapter deals with the manufacture of tube and rod. Each of the major fields of application, automobile, air-craft and boat-building, is treated in detail.

It is hoped by the authors that this comprehensive presentation of these plastics will point up the "gaps to be filled and loose ends to be tied up before the field of reinforced plastics can be put on a firm technical basis." There is no doubt that by presenting this over-all view of the subject they have made a definite contribution to the definition of glass plastics and the comprehension of their limitations as well as their possibilities.

—Dr. Frederick A. Hessell, F.A.I.C.

Essays in Biochemistry

Samuel Graff, Editor. John Wiley & Sons, Inc. 1956. 345 *pp.* 6" x 9½". $6.50.

These 25 essays were prepared in honor of Dr. Hans T. Clarke, F.A.I.C., on the occasion of his retirement as professor and chairman of the Department of Biochemistry, College of Physicians and Surgeons, Columbia University. The authors are all former students or associates of Dr. Clarke. A great variety of subjects are covered in this volume. For example: Some Metabolic Products of Basidiomycetes; Heterogeneity of Deoxyribonucleic Acid; Biosynthesis of Branched-Chain Compounds; Development of a Plasma Volume Expander; Remarks on Conjugated Proteins; Biochemistry of Bacterial Viruses; Biosynthesis of Peptide Bonds; Nature of Cancer; Glycogen Turnover. The diversity is well justified since "frequently the techniques of many scientific disciples are needed in order to uncover nature's secrets." These essays are an important addition to the biochemical literature.

—Dr. Henry Tauber, F.A.I.C.

The Principles of Chemical Equilibrium

By Kenneth Denbigh. Cambridge University Press. 491 *pp.* 6" x 9". $7.50.

We have here a complete thermodynamics at equilibrium of chemical and physical change; mainly mathematical with some new applications to adsorption and crystal structure.

Reflections of a Physicist

By Percy Williams Bridgman. Second Edition. Philosophical Library. 1955. 576 *pp.* $6.00.

Cybernetics and automation have inspired ten new papers here added to those in the first, 1950, edition. The author asks, "What are the inherent limitations imposed by our thinking mechanism? What is the significance of the fact that 'abstractions' and 'generalizations' and the very concepts of 'time' and 'space' occur only in conjunction with a human nervous system? I believe that the answer . . . will lead us across a threshold into something new and revolutionary." The book contains an interesting discussion of invention and the position of the scientist in society.

—Dr. John A. Steffens, F.A.I.C.

Mechanisms of Polymer Reactions

Vol. III. High Polymers. By G. M. Burnett. Interscience Publishers, Inc., 493 *pp.* $11.00.

Written by a member of the Chemistry Department at the University of Birmingham, England, this volume covers important work done in this field in the decade since the appearance of Marck and Raff's classic "High Polymeric Reactions."

So much has been published on the subject of polymeric reactions in the past few years that the pattern of the first edition could not be followed here. Instead of trying to review the literature, Dr. Burnett has discussed general principles and filled in this background by examples of specific cases. Particular emphasis has been given to the general kinetics of radical polymerization with the object of revealing the more obscure manipulations required and to introduce modifications by setting a detailed pattern.

For the polymer chemist this book has value not only for its explanation of recent developments in the field (such as the radical depolymerization processes,) but also for its provocative references to problems still unsolved. Author and subject indices are included.

—Dr. Frederick A. Hessel, F.A.I.C.

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Chemical Books Abroad

Rudolph Seiden, F.A.I.C.

Moser-Verlag, Garmisch-Partenkirchen: *Bituminoese Anstrichstoffe,* by F. J. Heinrich; 1950-54, paperbound. This literature and patent monograph on bituminous coating materials consists of 3 parts: *I* (37 pp., DM 19.50)—raw materials, solvents, fillers, pigments; *II* (30 pp., DM 17.00)—properties and uses in home and industry; *III* (68 pp., DM 30.00)—structure and physical chemistry of bitumens, coal tars, and pitches; with 268 literature and 96 patent references. • *Therapeutische Bedeutung des Chlorophyll,* by P. Biesalski, 1954—another monograph of this series. It reviews the therapeutic importance of chlorophyll in 2 issues (each DM 12.-): *I* (21 pp.)—The internal uses, especially for deodorisation; *II* (24 pp.) —the external uses, particularly for wound treatment. With a total of 171 literature references, and numerous case reports.

Vandenhoeck & Ruprecht, Goettingen: *Grundriss der technischen Chemie, Vol. V;* by C. Kroeger; 1955, 235 pp.; paperbound DM 19.80—This is the fourth issue of a 7-part work. (see THE CHEMIST, March, 1953 and May, 1953). It contains 74 illustrations, 32 flowsheets, 57 tables and many other data concerning plants and animal material which are used in technical chemistry.

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"Atomic Energy & Corning Glass Works." Leaflet. Corning Glass Works, Corning, New York.

"Soviet Professional Manpower", by Nicholas DeWitt. National Science Foundation. $1.25 a copy. Order from Superintendent of Documents, Washington 25, D.C.

"Wall Chart (17" x 23") on Safe Storage and Handling of Chlorine. Diamond Alkali Co., 300 Union Commerce Bldg., Cleveland 14, Ohio.

"New Carbon-14 Labeled Compounds." Information. Tracerlab, Inc., 130 High St., Boston 10, Mass.

"Platinum Group Metals as Catalysts." Booklet. Baker & Co., Inc., 113 Astor St., Newark 5, N.J.

"Reference Bulletin on Sewage Treatment." Bulletin 240. 8-pp. Precision Scientific Co., 3737 W. Cortland St., Chicago 47, Ill.

"Glycerine Facts." Publication of Glycerine Producers' Association, 295 Madison Ave., New York 17, N.Y.

"Rotameter Bulletin No. 120." 8-pp. Brooks Rotameter Co., Lansdale, Pa.

"Emeryfacts, Specifications & Characteristics", brochure on fatty acids, plasticizers, oleic esters, etc. Emery Industries, Inc., Dept. 5, Carew Tower, Cincinnati 2, Ohio.

"Blue M's New Practical Approach to Controlled Humidity." Information. The Emil Greiner Co., 20-26 N. Moore St., New York 13, N.Y.

"Financing Industrial Laboratories." Brochure. Chicago Apparatus Co., 1735 N. Ashland Ave., Chicago 22, Ill.

"Synthetic Waxes." Catalog. Glyco Products Co., Inc., Empire State Bldg., New York 1, N.Y.

"Physical Properties of Synthetic Organic Chemicals." 24-pp. Booklet F-6136. Carbide & Carbon Chemicals Co., 30 E. 42nd St., New York 17, N.Y.

"School Set of Atom Models." Booklet. Arthur S. LaPine & Co., 6001 S. Knox Ave., Chicago 29, Ill.

"Colors for Outdoor Applications on Anodized Aluminum." Brochure. Sandoz Chemical Works, 61 Van Dam St., New York 13, N.Y.

"Reference Guide to Dow Corning Silicone Products." 12-pp. Dow Corning Corp., Midland, Mich.

"Thimet, systemic insecticide." Information. American Cyanamid Co., 30 Rockefeller Plaza, New York 20, N.Y.

"Exide-Ironclad Batteries with Polyethylene Tubing and Tube Sealers." Exide Industrial Div., The Electric Storage Battery Co., Box 8109, Philadelphia 1, Pa.

"Special Test Bulletin on Gas Mask Vision." Acme Protection Equipment Co., 1297 Kalamazoo St., South Haven, Mich.

"New Ceramic Grinding Plates." Information. Bico, Inc., 3116 Valhalla Dr., Burbank, Calif.

"Transite Sewer Pipe with Ring-Tite Coupling." 8-pp. booklet. Johns-Manville, 22 East 40th St., New York 16, N.Y.

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"Federal Funds for Science." Report. National Science Foundation. 30-cents. Superintendent of Documents, Washington 25, D.C.

"Plaskon Nylon 8200 — Properties & Characteristics." Information. Barrett Div., Allied Chemical & Dye Corp., 61 Broadway, New York 6, N.Y.

"Air Pollution Control District Report." Monthly publication of Air Pollution Control District, County of Los Angeles, 434 S. San Pedro St., Los Angeles 13, Calif.

"Dialkyl Methyl Tertiary Amines." Information. Market Development Dept., Armour Chemical Div., 1355 W. 31st St., Chicago, Ill.

"National Science Foundation Fellowships. Senior. Postdoctoral. Awards." Information. Div. of Scientific Personnel & Education, National Science Foundation, Washington 25, D.C.

"Redesigned Ionograph. Apparatus for Paper Strip Electrophoresis." Bulletin 690A. Precision Scientific Co., 3737 W. Cortland St., Chicago 47, Ill.

"Featherweight Goggles for Eye Protection." Information. General Scientific Equipment Co., 2700 W. Huntingdon St., Philadelphia 32, Pa.

"Fiske Differential Thermometer." Information. Advanced Instruments, Inc., Needham 92, Mass.

"Molybdenum Catalysts for Industrial Processes." 24-pp. Booklet. Climax Molybdenum Co., Dept. L, 500 Fifth Ave., New York 36, N.Y.

"Rolla-Bench. Mobile Bench Unit." Bulletin. Palo Laboratory Supplies, Inc., 81 Reade St., New York 7, N.Y.

"Chromacon Apparatus for Vapor Phase Chromotography." Information. Podbielniak, Inc., 341 E. Ohio St., Chicago 11, Ill.

"Improved Moist-O-Graph." Bulletin 9311. W. A. Lang, Product Editor., Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia 44, Pa.

"VirTis Freeze-Mobile. Freeze Drying Apparatus." Information. E. Machlett & Son, 220 E. 23rd St., New York, N.Y.

"Wanted: Scientists:" Is the title of a section in the Annual Report of Chas. Pfizer & Co., to its shareholders. "We are not producing the scientists that the challenge of the future demands," the Report states and asks shareholders to cooperate with the schools to encourage laboratories, physics, chemistry, and mathematics courses, and to encourage future scientists. This is said to be the first formal appeal to promote the study of science made directly to corporate shareholders through the medium of an annual report.

Appointed: Robert C. Demsker, M.A.I.C., as chemical engineer in executive capacity at the Central Laboratory of U.S. Plywood, Brewster, N.Y.

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Acquired: By Arthur D. Little, Inc., of Cambridge, Mass., The Miner Laboratories, chemical consultants of Chicago, Illinois. John R. Kirkpatrick will manage the new ADL Midwest Division. Dr. C. S. Miner, Jr., will continue to direct its technical operations.

AIC Fellows: Who presented papers at the Annual Meeting of The American Oil Chemists' Society, in Houston, Texas, April 23-25, include W. J. Podbielniak, Morris Mattikow, Hans Wolff, M. F. Stansbury, K. T. Holley, and C. W. Hoerr.

Short Course: On unit processes in the fatty oil, soap, and detergent industries, to be given by the American Oil Chemists' Society at Purdue University, Lafayette, Ind., July 16-20, 1956. For information, address the society at 35 E. Wacker Drive, Chicago 1, Illinois.

Meeting: Of the Institute of Radio Engineers scheduled for October 25-26, 1956, at the Shoreham Hotel, Washington, D.C.

Appointed: Benjamin Kapp, F.A.I.C., to the industrial research staff of Biochemical Procedures, Inc., 8350 Wilshire Boulevard, Beverly Hills, Calif., the West Coast laboratory of Foster D. Snell, Inc., New York 11, N.Y. Mr. Kapp is president of the Flavor Extract Manufacturers' Association of California.

Elected: Raymond Stevens, F.A.I.C., as president of Arthur D. Little, Inc., 30 Memorial Drive, Cambridge, Mass. He joined the company in 1920, and has been vice president since 1930. Dr. Earl P. Stevenson, F.A.I.C., president of the company since 1935, is now chairman of the board.

Established: By George H. Taft, F.A.I.C., at 9 Monument St., Concord, Mass., a personal consultant service for the assistance of management in the chemical and plastic industries. He was formerly vice president of the Deecy Products Co., and previously with the B. F. Goodrich Chemical Company.

Advisory Committee: For the 9th National Chemical Exposition to be held in the Cleveland Public Auditorium, Nov. 27-30, 1956, includes the following AIC Fellows: Lawrence Flett, Robert C. Hienton, Dr. Sidney D. Kirkpatrick, Dr. Walter J. Murphy, Raymond Stevens, Dr. Ernest H. Volwiler, Dr. J. C. Warner, and Dr. Clyde E. Williams.

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Only 8 Per Cent: Of the chemists in America are engaged in the food industry, though one-third of the consumer's dollar goes for the purchase of food, stated Dr. Ernest W. Reid, F.A.I.C., chairman of the board of Corn Products Refining Co., at the Texas meeting of the Institute of Food Technologists and the Southwest Research Institute in March. He called for a program to bring more scientists to all phases of food research.

Moved: The Warner-Chilcott Laboratories from New York to Morris Plains, N.J. Dr John A. King, F.A.I.C., is director of chemical research.

To Europe: Dr. Alexander Silverman, Hon. AIC, professor of chemistry emeritus, University of Pittsburgh, who is visiting England. April 11th to 20th, he presided at sessions of the Commission on Inorganic Chemical Nomenclature of the International Union of Pure and Applied Chemistry. April 23rd, he visited the Department of Glass Technology of the University of Sheffield and participated in the program of the Society of Glass Technology of England.

Meeting: Nov. 22 - Dec. 3, 1956, First Congress of the European Federation of Corrosion (organized by the Societe de Chimie Industrielle, Paris) on the occasion of the Convention of Chemical Engineering and the IVe Salon de la Chimie, Paris, France.

Opened: In March, the new $1,100,000, laboratory building of the Dow Chemical Company, Midland, Mich., for research in biochemistry. The research director is Dr. Don D. Irish. Sixty-four men and women are on the staff.

Conference: On ozone, sponsored by Armour Research Foundation of Illinois Institute of Technology, to be held in Chicago, Ill., Nov. 28-30, 1956, Clark E. Thorp, F.A.I.C., manager of chemistry and chemical engineering research of the Foundation, is chairman of the conference.

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KEEPING UP WITH JET AIRPLANES?

Some of the same type of engineering development work, which produced jet airplanes and such sensational progress in the aviation industry, has been done on various types of stationary jets. While results are not as spectacular, improvements have been even greater percentage-wise in some smaller industries.

For example, the jet heater, working at very high velocity, possibly on corrosive liquids, will cost a very small fraction of the price of a surface heater. When designed properly, the heater can also raise the pressure of the liquid substantially and completely eliminate one or more pumps, which can be quite expensive if made from special materials.

A jet absorber is another good example. In some cases, a unit the approximate size of a man's arm can take the place of an absorption tower 3 feet in diameter and 10 or 12 feet high, with tremendous savings in first cost and no increase in operating cost. The absorber can literally supersaturate a liquid with a gas by discharging at a higher pressure than desired. Equilibrium is then established by reducing the pressure and liberating some gas, leaving a completely saturated solution at any desired pressure within certain ranges.

Of course, progress has also been made in efficiency and dependability of the best known application of industrial jets, which is steam jet vacuum equipment and vacuum refrigeration. Information on any of this type of equipment is available on request.

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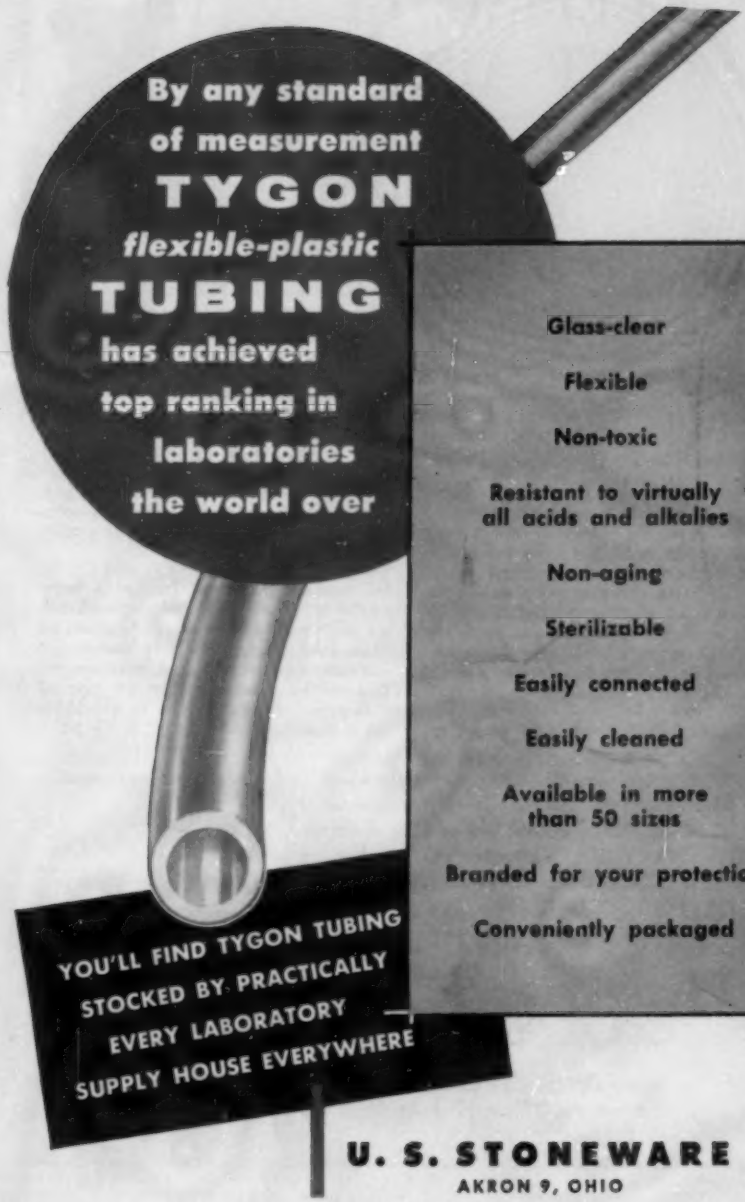

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